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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/617,146	07/10/2003	Anca Faur-Ghenciu	GP-302809	1398
23368 7590 04/28/2010 DINSMORE & SHOHL LLP FIFTH THIRD CENTER, ONE SOUTH MAIN STREET SUITE 1300 DAYTON, OH 45402-2023				
EXAMINER				
HANDAL, KAITLY V				
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1795				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/617,146

**Applicant(s)**

FAUR-GHENCIU ET AL.

**Examiner**

KAITY V. HANDAL

**Art Unit**

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 March 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-4, 7-14, 16, 18-27, 29, 31-38, 40-42, 44-46, 48, 49, 51, 53, 55-58 and 60 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 7-14, 16, 18-27, 29, 31-38, 40-42, 44-46, 48, 49, 51, 53, 55-58 and 60 is/are rejected.
- 7) ☒ Claim(s) 29 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-946)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Claim Objections***

1. Claim 29 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 29 presently depends from cancelled claim 28. For prosecution purposes, claim 29 has been treated to depend from claim 24, as set forth below.

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-4, 7-14, 16, 18-27, 29, 31-38, 40-42, 44-46, 48-49, 51, 53, 55-58, 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nunan (US 6,040,265).

With respect to claims 1-2, 4, 12-13, 16, 24-25, 27, 29, 36-37, 42, 44-45, 51, 53, 55, 60, Nunan teaches an apparatus for reducing an amount of carbon monoxide in process gas wherein the catalyst is a ceria based catalyst which promotes water gas shift reactions (col. 1, lines 43-56), the catalyst system comprising a noble metal/(Pt or Pd) (col. 10, line 65); a mixed metal oxide support consisting essentially of cerium oxide and zirconium oxide, wherein cerium oxide is present in an amount from about

45% to about 90% by weight of mixed metal oxide and zirconium/lanthanum oxide is present in amount from about 10% to 55% by weight of mixed metal oxide (col. 10, lines 64 col. 11, lines 1-5); and passing the process fuel gas through the water gas shift converter in effective contact with the high activity water gas shift catalyst system and converting at least 50% of the carbon monoxide in the process fuel gas into carbon dioxide and hydrogen by a water gas shift reaction over a temperature range of about 300°C to about 450°C/(400°C to about 575°C) (see Figure 15).

Nunan does teach that his catalyst is for reducing an amount of carbon monoxide in process gas wherein the catalyst is a ceria based catalyst which promotes water gas shift reactions (col. 1, lines 43-56). Therefore, a water gas shift reaction does take place in Nunan's catalyst system. Therefore, it would be obvious to one having ordinary skill in the art to try placing Nunan's catalyst system in a "water gas shift reactor", or any "reactor", and pass there through a process gas stream as opposed to an exhaust stream for the purpose of achieving an entirely expected result – which is reducing carbon monoxide. Thereby, one skilled in the art would merely place a catalyst system known to achieve an expected result in a specific known reactor/reaction conditions in a effort to try achieving the expected results taught in the prior art of Nunan. Nunan's disclosure obviates to one of ordinary skill in the art to try using his catalyst system to achieve the expected result of reducing carbon monoxide in a gas stream. See KSR - Example D. Furthermore, Nunan's catalyst is the same as that instantly claimed and therefore will perform as such.

Nunan further teaches wherein the promoter/alkaline earth metal/Calcium is present in an amount of between 1% and about 20% by weight of total catalyst (col. 14, lines 8-25) which touches the instantly claimed range of 0.1% to 1.0% by weight.

With respect to claims 3, 14, 26, 38, 46, 56, Nunan further teaches wherein the noble metal/(group VIII) is present in an amount of between about 0.01% to about 4% by weight of total catalyst (col. 13, lines 40-43).

With respect to claims 7, 18-19, 31, 40, 48, 57, Nunan further teaches wherein the mixed metal oxide support further comprises a support dopant/(additional promoter) selected from lanthanum (col. 14, lines 8-15).

With respect to claims 8, 20, 32, Nunan further teaches wherein the support dopant/(additional promoter) is in the form of a metal oxide (col. 14, lines 8-21).  
With respect to claims 9, 21, 33, 41, 49, 58, Nunan further teaches wherein the support dopant/(additional promoter) is present in an amount of between about 1% and about 20% by weight of mixed metal oxide (col. 14, lines 8-25).

With respect to claim 10-11, 22-23, 34-35, Nunan further teaches wherein the process fuel gas passes through the water gas shift at a temperature of about 225°C (col. 15, lines 53-57).

### **Response to Arguments**

3. Rejection made under 35 USC 112 is withdrawn by the Examiner due to applicant's amendment made to the claims.
4. Prior Art

Applicant's arguments filed 3/16/2010 have been fully considered but they are not persuasive.

- a. On page 11, 2<sup>nd</sup> paragraph, Applicant argues that Nunan does not teach or suggest that his catalyst can be placed in a water gas shift converter and that Nunan teaches a three way catalyst in which three types of reactions take place that are different from a water gas shift reaction.
- b. On page 11, 3<sup>rd</sup> paragraph, applicant argues that Nunan's reactions are different from the water gas shift reaction in which the inlet is carbon monoxide and water.

Examiner respectfully points out the following:

- i. Applicant is arguing "the use" of the instantly claimed catalyst. The instant claims fail to positively recite the method such that carbon monoxide and water are introduced into the reactor. The question is, since applicant recognizes that a water gas shift reactor is distinct from other reactors/catalytic converters based on not only the catalyst used but also the feed streams and, therefore, the outlet streams; where is this found in the instant claims? Additionally, how is the water gas shift catalyst, as claimed, different from Nunan's disclosure?
- ii. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., water) are not recited in the rejected claim(s).

Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

iii. Irrespective of (i) and (ii), Nunan's catalyst is the same as that instantly claimed and will, therefore, perform as such; and since a water gas shift reaction is taking place due to the presence of ceria; placing the catalyst system of Nunan in a catalytic converter or in a shift reactor or in any reactor, the catalyst system will continue to perform in the same fashion - effecting a water gas shift reaction. Thereby, one skilled in the art would merely place a catalyst system known to achieve an expected result in a specific known reactor/reaction conditions in a effort to try achieving the expected results taught in the prior art of Nunan. Nunan's disclosure obviates to one of ordinary skill in the art to try using his catalyst system to achieve the expected result of reducing carbon monoxide in a gas stream. See KSR - Example D.

iv. Nunan does teach that his catalyst is for reducing an amount of carbon monoxide in process gas wherein the catalyst is a ceria based catalyst which promotes water gas shift reactions (col. 1, lines 43-56). Therefore, a water gas shift reaction does take place in Nunan's catalyst system in addition to the reactions known to take place in a three-way catalyst. Therefore, it would be obvious to one having ordinary skill in the art to try placing Nunan's catalyst system in a "water gas shift reactor", or

any "reactor", and pass there through a process gas stream, including an exhaust stream, for the purpose of achieving an entirely expected result – which is reducing carbon monoxide.

v. The fact that the instant claim reads on a method for reducing an amount of carbon monoxide in process fuel gas in a water gas shift converter, the claim language does not preclude treating exhaust gas as in Nunan since exhaust gas can be considered "a process fuel gas", for example in a burner.

vi. The claims use "comprising" which is open transitional language and does not exclude a reference from having more elements and/or additional reactions than those recited in the instant claims. MPEP 2111.03 [R-3]. The claimed transitional term "comprising" permits the inclusion of other steps, elements, or materials, including both, those disclosed but not claimed by applicant and those neither disclosed nor contemplated by applicant. See *In re Baxter*, 656 F.2d 679, 686, 210 USPQ 795, 802 (CCPA 1981).

c. On page 14, last paragraph, applicant argues:

In addition, contrary to the examiner's statement, Nunan does not teach or suggest converting at least 50% of the carbon monoxide in the process fuel gas into carbon dioxide and hydrogen by a water gas shift reaction over a temperature range of about 300°C to about 450°C/(400°C to about 575°C) (see Figure 15)." Using the line shown in Fig. 15, the Ce, Zr support does not reach 50% conversion of CO until at least 350°C. The first data point showing 50% conversion for the Ce,Zr support is at 450°C. Note that there are no data points between 300°C and 450°C for the Ce/Zr support like are shown in the other graphs.



Examiner respectfully disagrees that Nunan does not teach converting at least 50% of the carbon monoxide in the process fuel gas into carbon dioxide and hydrogen by a water gas shift reaction over a temperature range of about 300°C to about 450°C. Though that the first data point showing 50% conversion for the Ce,Zr support is at 450°C and that there are no data points between 300°C and 450°C for the Ce/Zr support like are shown in the other graphs; the temperature of 450°C is touching the boundary of the instantly claimed range of about 300°C to about 450°C. Therefore, Nunan does teach converting at least 50% of the carbon monoxide in the process fuel gas into carbon dioxide and hydrogen by a water gas shift reaction over a temperature range of about 300°C to about 450°C.

d. On pages 14, last 2 lines - page 15, lines 1-2, applicant argues:

"Moreover, neither the graph nor the corresponding discussion indicates that a "promoter comprising alkali metals, or alkaline earth metals, or combinations thereof" was present with any of the supports shown in Fig. 15. Thus, Fig. 15 does not teach or suggest the claimed conversion rates for the claimed compositions.

Examiner respectfully disagrees. Nunan's disclosure teaches the presence of the promoter, as set forth in the rejection above, which applies to the examples discussed therein. See column 14, lines 8-15, in which lines 9-12 read "... the catalysts of this invention may also contain additional promoters, ...can include...alkaline earths; and lines 23-24 clearly state that the additional promoter is present in an amount of about 1-20 wt. % based on the total weight of the catalyst. Therefore, the catalysts disclosed in Nunan, including the example of Figure 15, do comprise a promoter as set forth herein and above.

***Conclusion***

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **KAITY V. HANDAL** whose telephone number is (571)272-8520. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on (571) 272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8520.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/K. V. H./  
Examiner, Art Unit 1795

4/14/10

/Alexa D. Neckel/  
Supervisory Patent Examiner, Art Unit 1795